Claims

1. A method for detecting the differentiation status of stem cells comprising detecting the expression of 5T4 antigen in said stem cells.

2. A method as claimed in claim 1 wherein a low level of 5T4 antigen expression indicates undifferentiated or pluripotent stem cells.

3. A method as claimed in claim 2 wherein said stem cells are mammalian stem cells.

4. A method as claimed in claim 3 wherein said stem cells are embryonic stem cells.

5. A method as claimed in claim 2 or 3 wherein said stem cells are murine, human, primate porcine, feline, bovine, ovine or canine.

6. A method as claimed in any of claims 2 to 5 wherein said 5T4 expression is detected by anti-5T4 antibodies.

7. A method as claimed in any of claims 2 to 5 wherein said 5T4 expression is detected by expression of a reporter gene wherein said reporter gene is under control of the 5T4 promoter.

8. A method of detecting differentiation status of a population of mammalian stem cells comprising the steps of:
   a) taking a sample of cells from said population of mammalian stem cells;
   b) incubating said sample with a labelled anti-5T4 antibody such that specific binding of anti-5T4 antibody to 5T4 antigen occurs; and
   c) detecting said binding of said antibody wherein binding of the anti-5T4 antibody to cells in the sample is indicative of the presence of 5T4 and differentiated stem cells.

9. A method for separating a population of undifferentiated or differentiated mammalian stem cells from a mixture of differentiated and undifferentiated stem cells comprising:
   a) binding cells with anti-5T4 antibody;

b) separating cells with bound antibody from cells with no bound antibody; and

c) isolating the cells.

10.A method as claimed in claim 9wherein said isolated cells are viable.

11. A method for testing growth media for its use in maintaining mammalian stem cells comprising detecting expression of 5T4 comprising the steps of:

a) taking mammalian stem cells in culture;

b) applying test media; and

c) assessing 5T4 expression in the absence or presence of said media wherein the presence of 5T4 is an indication of stem cells undergoing differentiation.

12.A method for detecting the ability of a test compound to induce mammalian stem cell differentiation comprising the steps of:

a) incubating a mammalian stem cell culture in the presence or absence of said test compound;

b) detecting 5T4 expression; and

c) comparing the levels of 5T4 expression in cells wherein increased 5T4 expression in those cells incubated in the presence of said test compound indicates differentiation induction by said test compound.

13. A method as claimed in claims 11 or 12 wherein 5T4 expression is detected by expression of a reporter gene wherein said reporter gene is under control of the 5T4 promoter.

14. Use of an antibody recognising 5T4 in a method of detecting differentiated mammalian cells.

15. Use of an antibody recognising 5T4 in a method of testing growth media for its use in maintaining mammalian stem cells.

16. A method for detecting differentiation status of a mammalian stem cell comprising:

a) introducing into a stem cell a vector comprising a 5T4 promoter sequence operably linked to a nucleic acid encoding a reporter gene;

b) detecting an increase in expression of the reporter gene as an indication of differentiation.

17. A method as claimed in claim 16 wherein the vector comprising 5T4 promoter sequence is a targeting construct for homologous recombination.

18. A method of modifying a mammalian stem cell comprising introducing a nucleic acid sequence into a mammalian cell such that said nucleic acid sequence is placed under the control of the 5T4 promoter sequence.

19. A method of modulating mammalian stem cell differentiation comprising modulating 5T4 expression or functional activity.

20.Use of an agent that modulates 5T4 expression or functional activity in the modulation of mammalian stem cell differentiation.